

BIOTECHNOLOGY DISCOVERY RESEARCH

Our greatest interests lie in the following areas:

Biotherapeutic Discovery and Validation:

- Antibody discovery: *in vitro* and *in vivo*
- Antibody screening platforms; e.g., microfluidics
- Novel immunization platforms
 - Ion channels
- Bi-specific/multi-functional platforms
- Alternative antibody scaffolds
- Protein engineering
- Translational cell-based platforms
 - 3D culture; e.g., 3D printing
 - ‘Organ on a chip’ nanotechnology
- iPS cell differentiation
- Vascular endothelial cell biology

Biotherapeutic Optimization:

- Protein expression/production technologies
 - Non-mammalian/microbial expression and production systems
 - Cell line generation
 - Cell culture
 - Antibody/Fab production systems
- Purification processes
- Glycosylation, including non-mammalian
- Peptide chemistry
 - Semi-synthetic or recombinant
 - Non-natural amino acid incorporation
- Protein: protein interactions
 - Macrocyclics





- Peptide/protein drug conjugates
 - Novel linker/conjugation chemistries
- Time extension of antibodies, peptides and proteins
 - Size: alternatives to PEG-ylation
 - Controlled release
- Site-specific chemical modification
- Biophysical analysis
 - Mass spectrometry data analysis tools
 - Characterization of particle mass, composition, morphology; i.e., >1 um
 - Protein structure at higher resolution than CD, FTIR, etc.
 - Automated formats for existing biophysical techniques; e.g., static light scattering
 - Protein colloidal stability/protein-protein interactions at >100+ mg/mL

Biotherapeutic Formulation/ Delivery:

- Oral
 - Permeation enhancers, receptor-mediated transcytosis, nanotechnologies
- Blood-brain barrier
- Capillary endothelial barrier
- Pericellular junctions (subQ delivery)
- Intracellular targeting
- Formulation design
 - Excipients, co-formulations, nanotechnologies
- Devices
- *In vivo* targeted delivery of nucleic acid-based molecules

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